

What is claimed is.

1        1. A method of transmitting data over a communica-  
2        tions network, comprising the steps of:  
3        receiving content from a content provider;  
4        responsive to said content establishing a first group  
5        directory in a cache;  
6        transmitting said first group directory from said  
7        cache on a data channel to a subsidiary cache;  
8        establishing a second group directory in said sub-  
9        sidiary cache, said second group directory being derived  
10       from said first group directory; and  
11       transmitting said second group directory from said  
12       subsidiary cache to a multicast group of receivers.

1       2. The method according to claim 1, wherein said step  
2       of transmitting said first group directory is performed  
3       using a REMADE protocol.

1       3. The method according to claim 1, wherein said step  
2       of transmitting said first group directory is performed  
3       by periodic transmission thereof.

1       4. The method according to claim 1, wherein said step  
2       of transmitting said first group directory is performed  
3       in response to a request from a receiver thereof.

1        5. The method according to claim 1, wherein said step  
2 of transmitting said first group directory is performed  
3 according to a policy of said content provider.

1        6. The method according to claim 1, wherein said step  
2 of transmitting said second group directory is performed  
3 by periodic transmission thereof.

1        7. The method according to claim 1, wherein said step  
2 of transmitting said second group directory is performed  
3 in response to a request from a receiver.

1        8. The method according to claim 1, wherein said step  
2 of transmitting said second group directory is performed  
3 using a REMADE protocol.

1        9. The method according to claim 1, wherein said step  
2 of transmitting said second group directory is performed  
3 according to a policy of said content provider.

1        10. The method according to claim 1, wherein said  
2 content provider comprises a plurality of content provid-  
3 ers.

1        11. The method according to claim 1, wherein said  
2 subsidiary cache comprises a plurality of subsidiary  
3 caches.

1        15. The method according to claim 1, wherein said  
2        second group directory comprises a root directory hierar-  
3        chically linked to a plurality of subdirectories, said  
4        subdirectories carrying a list of data items, a subtree  
5        of said second group directory being defined by one of  
6        said subdirectories and at least one linked subdirectory  
7        thereunder.

1 16. A computer software product, comprising a com-  
2 puter-readable medium in which computer program instruc-  
3 tions are stored, which instructions, when read by at  
4 least one computer, causes said at least one computer to  
5 execute a method of transmitting data over a communica-  
6 tions network, comprising the steps of:

7 in a first server receiving content from a content  
8 provider;

9 responsive to said content establishing a first group  
10 directory in a cache of said first server;

11 transmitting said first group directory from said  
12 cache on a data channel to a second server having a sub-  
13 sidiary cache;

14 establishing a second group directory in said sub-  
15 sidiary cache, said second group directory being derived  
16 from said first group directory; and

17 transmitting said second group directory from said  
18 subsidiary cache to a multicast group of receivers.

1 17. The computer software product according to claim  
2 16, wherein said step of transmitting said first group  
3 directory is performed using a REMADE protocol.

1 18. The computer software product according to claim  
2 16, wherein said step of transmitting said first group  
3 directory is performed by periodic transmission thereof.

1 19. The computer software product according to claim  
2 16, wherein said step of transmitting said first group

1           25. The computer software product according to claim  
2   16, wherein said content provider comprises a plurality  
3   of content providers.

1        26. The computer software product according to claim  
2        16, wherein said subsidiary cache comprises a plurality  
3        of subsidiary caches.

1        27. The computer software product according to claim  
2        26, wherein the method further comprises the steps of:  
3        receiving a transmission request from a member of  
4        said group of receivers, wherein said transmission re-  
5        quest is responsive to said second group directory; and  
6        responsive to said transmission request, transmitting  
7        a data item from said subsidiary cache to said receiver.

1        28. The computer software product according to claim  
2        26, wherein said cache and said subsidiary caches are  
3        linked together as a hierarchical tree, said cache form-  
4        ing a root of said hierarchical tree.

1        29. The computer software product according to claim  
2        16, wherein said first group directory comprises a root  
3        directory hierarchically linked to a plurality of subdi-  
4        rectories, said subdirectories carrying a list of data  
5        items, a subtree of said first group directory being de-  
6        fined by one of said subdirectories and at least one  
7        linked subdirectory thereunder.

1        30. The computer software product according to claim  
2        16, wherein said second group directory comprises a root  
3        directory hierarchically linked to a plurality of subdi-

4     rectories, said subdirectories carrying a list of data  
5     items, a subtree of said second group directory being de-  
6     fined by one of said subdirectories and at least one  
7     linked subdirectory thereunder.

1         31. A system for transmitting data over a communica-  
2     tions network, comprising:

3         a first server, having a cache therein, receiving  
4     content from a content provider, wherein responsive to  
5     said content a first group directory is established in  
6     said cache by said first server,

7         a second server, having a subsidiary cache therein,  
8     said first group directory being transmitted by said  
9     first server from said cache on a data channel to said  
10    subsidiary cache, wherein responsive to said first group  
11    directory, a second group directory is established in  
12    said subsidiary cache by said second server, said second  
13    group directory being derived from said first group di-  
14    rectory, and said second group directory is transmitted  
15    by said second server from said subsidiary cache to a  
16    multicast group of receivers.

1         32. The system according to claim 31, wherein said  
2     first group directory is transmitted using a REMADE pro-  
3     tocol.

1         33. The system according to claim 31, wherein said  
2     first group directory is transmitted periodically.

1        34. The system according to claim 31, wherein said  
2 first group directory is transmitted in response to a re-  
3 quest from a receiver thereof.

1        35. The system according to claim 31, wherein said  
2 first group directory is transmitted according to a pol-  
3 icy of said content provider.

1        36. The system according to claim 31, wherein said  
2 second group directory is transmitted periodically.

1        37. The system according to claim 31, wherein said  
2 second group directory is transmitted in response to a  
3 request from a receiver.

1        38. The system according to claim 31, wherein said  
2 second group directory is transmitted using a REMADE pro-  
3 tocol.

1        39. The system according to claim 31, wherein said  
2 second group directory is transmitted according to a pol-  
3 icy of said content provider.

1        40. The system according to claim 31, wherein said  
2 content provider comprises a plurality of content provid-  
3 ers.



1 41. The system according to claim 31, wherein said  
2 subsidiary cache comprises a plurality of subsidiary  
3 caches.

1 42. The system according to claim 41, wherein said  
2 cache and said subsidiary caches are linked together as a  
3 hierarchical tree, said cache forming a root of said hi-  
4 erarchical tree.

1 43. The system according to claim 41, wherein said  
2 second server receives a transmission request from a mem-  
3 ber of said group of receivers, wherein said transmission  
4 request is responsive to said second group directory; and  
5 responsive to said transmission request, said second  
6 server transmits a data item from said subsidiary cache  
7 to said receiver.

1 44. The system according to claim 31, wherein said  
2 first group directory comprises a root directory hierar-  
3 chically linked to a plurality of subdirectories, said  
4 subdirectories carrying a list of data items, a subtree  
5 of said first group directory being defined by one of  
6 said subdirectories and at least one linked subdirectory  
7 thereunder.

1 45. The system according to claim 31, wherein said  
2 second group directory comprises a root directory hierar-  
3 chically linked to a plurality of subdirectories, said  
4 subdirectories carrying a list of data items, a subtree

5 of said second group directory being defined by one of  
6 said subdirectories and at least one linked subdirectory  
7 thereunder.

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